# Appendix D

## Primary Undivided Arterial 4 Lane – Capacity Analysis

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# Primary Undivided Arterial 4 Lane – Capacity Analysis

HCS2000: Urban Streets Release 4.1

Phone: Fax:
E-Mail:

PLANNING ANALYSIS

| | | |
|---|---|---|
| Analyst: | LMB | |
| Agency/Co.: | P&D | |
| Date Performed: | 2/3/2003 | |
| Analysis Time Period: | | |
| Urban Street: | PRIMARY UNDIVIDED ARTERIAL 4 LANE | |
| Direction of Travel: | | |
| Jurisdiction: | | |
| Analysis Year: | | |
| Project ID: | CA High Speed Rail | |

Traffic Characteristics

| | | |
|---|---|---|
| Annual average daily traffic, AADT | 29200 | vpd |
| Planning analysis hour factor, K | 0.100 | |
| Directional distribution factor, D | 0.600 | |
| Peak-hour factor, PHF | 0.950 | |
| Adjusted saturation flow rate | 1800 | pcphgpl |
| Percent turns from exclusive lanes | 75 | % |

Roadway Characteristics

| | | |
|---|---|---|
| Number of through lanes one direction, N | 2 | |
| Free flow speed, FFS | 45 | mph |
| Urban class | 2 | |
| Section length | 1.00 | miles |
| Median | No | |
| Left-turn bays | Yes | |

Signal Characteristics

| | | |
|---|---|---|
| Signalized intersections | 8 | |
| Arrival type, AT | 3 | |
| Signal type (k = 0.5 for planning) | Actuated | |
| Cycle length, C | 90.0 | sec |
| Effective green ratio, g/C | 0.510 | |

Results

| | | |
|---|---|---|
| Annual average daily traffic, AADT | 29200 | vpd |
| Two-way hourly volume | 2920 | vph |
| Hourly directional volume | 1752 | vph → 875 vphpl |
| Through-volume 15-min. flow rate | 461 | v |
| Running time | 109.0 | sec |
| v/c ratio | 0.26 | |
| Through capacity | 1743 | vph |
| Progression factor, PF | 1.000 | |
| Uniform delay | 12.5 | sec |
| Filtering/metering factor, I | 0.974 | |
| Incremental delay | 0.4 | sec |
| Control delay | 12.9 | sec/v |
| Total travel speed, Sa | 17.0 | mph |
| Total urban street LOS | E | |

# Appendix E

## Basic Freeway Segment – Capacity Analysis

# Appendix E
# Basic Freeway Segment – Capacity Analysis

HCS2000: Basic Freeway Segments Release 4.1

Phone: Fax:
E-mail:

## Design Planning Analysis

| | |
|---|---|
| Analyst: | LMB |
| Date Performed: | 2/4/2003 |
| Agency or Company: | P&D |
| Analysis Time Period: | |
| Freeway/Direction: | Generalized 4-Lane |
| From/To: | |
| Jurisdiction: | Caltrans |
| Analysis Year: | |
| Description: | CA High Speed Rail |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Annual average daily traffic, AADT | 64576 | veh/day |
| Peak-hour proportion of AADT, K | 0.10 | |
| Peak-hour direction percent, D | 60 | % |
| Volume, DDHV | 3875 | veh/h ➔ 1940 vphpl |
| Peak-hour factor, PHF | 0.95 | |
| Trucks and buses | 5 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | 0.00 | % |
| Segment length | 0.00 | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicles PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.976 | |
| Driver population factor, vp | 1.00 | |
| Flow rate, vp | 4181 | pc/h |
| Desired Level Of Service | E | |

## Speed Inputs and Adjustments

| | | |
|---|---|---|
| Lane width | 12.0 | m |
| Right-shoulder lateral clearance | 6.0 | m |
| Interchange density | 0.50 | interchange/mi |
| Free-flow speed: | Measured | |
| FFS or BFFS | 65.0 | mi/h |
| Lane width adjustment, fLW | 0.0 | mi/h |
| Lateral clearance adjustment, fLC | 0.0 | mi/hmi |
| Interchange density adjustment, fID | 0.0 | mi/h |
| Number of lanes adjustment, fN | 4.5 | mi/h |
| Free-flow speed | 65.0 | mi/h |
| | Urban Freeway | |

## LOS and Performance Measures

| | | |
|---|---|---|
| Desired level of service | E | |
| Design flow rate, vp | 4181 | pc/h |
| Design free-flow speed, FFS | 65.0 | mi/h |
| Number of lanes required, N | 2 | |
| Average passenger-car speed, S | 59.7 | mi/h |
| Density, D | 35.0+ | pc/mi/ln |
| Level of service | E | |

Fewer number of lanes required will not produce the desired LOS.
Overall results are not computed when free-flow speed is less than 55 mph.